

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)
2. (Currently Amended) An imaging optical system ~~according to claim 1~~ comprising, in order from an object side:
a first lens having positive refracting power;
a second lens having negative refracting power, and a concave surface of which is directed toward the object side;
a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and
a fourth lens having negative refracting power;
wherein the second lens and the third lens are cemented together,
wherein at least one of surfaces of the fourth lens is an aspherical surface, and
wherein an aperture stop which is arranged on the object side of the first lens.
3. (Cancelled)
4. (Currently Amended) An imaging optical system ~~according to claim 1~~ comprising, in order from an object side:
a first lens having positive refracting power;
a second lens having negative refracting power, and a concave surface of which is directed toward the object side;
a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and
a fourth lens having negative refracting power,
wherein the second lens and the third lens are cemented together,
wherein at least one of surfaces of the fourth lens is an aspherical surface, and
wherein the aspherical surface of the fourth lens satisfies the following condition:
$$-1.0 < \phi_m / \phi_p < 0.25$$

where ϕ_m represents a power at a position of a maximum light height and ϕ_p represents a power at a paraxial position.

5. (Cancelled)

6. (Currently Amended) An imaging optical system ~~according to claim 3~~
comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the first lens is made of glass,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the following condition is satisfied:

$$0.4 < f/f_1 < 2.0$$

where f represents a focal length of the whole optical system and f_1 represents a focal length of the first lens.

7. (Currently Amended) An imaging optical system ~~according to claim 1~~
comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the following condition is satisfied:

$$0.5 < r_2f/r_{3r} < 4.0$$

~~where~~Where r_2f represents a radius of curvature of the second lens on the object side and r_3r represents a radius of curvature of the third lens on the image side.

8. (Currently Amended) An imaging optical system ~~according to claim 1~~ comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the second lens and the third lens form a cemented lens, and the following conditions are satisfied:

$$0.3 < f_{123}/|f_4| < 2.0$$

$$0.5 < f/|f_4| < 2.0$$

where f_{123} represents a composite focal length of the first lens and the cemented lens consisting of the second lens and the third lens, f_4 represents a focal length of the fourth lens, and f represents a focal length of whole optical system.

9. (Currently Amended) An imaging optical system ~~according to claim 1~~ comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the following condition is satisfied:

$$0.6 < EXP/f < 2.0$$

where EXP represents a length from an object plane to an exit pupil and f represents a focal length of the whole optical system.

10. (Cancelled)

11. (Currently Amended) An imaging optical system ~~according to claim 1 or 3~~ comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the following condition is satisfied:

$$0.40 (1/\mu\text{m}) < F_{\text{no}}/P(\mu\text{m}) < 2.20(1/\mu\text{m})$$

where F_{no} represents an F number fully opened and P represents a pitch of an imaging element.

12. (Currently Amended) An imaging optical system ~~according to claim 3~~ comprising, in order from an object side:

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the first lens is made of glass,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein the following condition is satisfied:

$$0.045 < ML/TL < 0.100$$

where TL represents an entire length of the optical system and ML represents a minimum axial thickness of plastic lenses.

13. (Currently Amended) An imaging optical system ~~according to claim 1 or 3 comprising, in order from an object side:~~

a first lens having positive refracting power;

a second lens having negative refracting power, and a concave surface of which is directed toward the object side;

a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together,

wherein at least one of surfaces of the fourth lens is an aspherical surface, and

wherein a cemented lens satisfies the following condition:

$$-0.30 < R_{ave}/R_c < 0.15$$

where R_c represents a radius of curvature of a cemented surface and R_{ave} represents an average value of a radius of curvature of an entrance surface and a radius of curvature of an exit surface.

14. (Previously Presented) An imaging optical system comprising, in order from an object side:

a first lens having positive refracting power,

a second lens having negative refracting power and a concave surface of which is directed toward the object side,

a third lens having positive refracting power and a convex surface of which is directed toward an image side and

a fourth lens having negative refracting power, wherein the second lens and the third lens are cemented together to form a cemented lens, and

wherein the following conditions are satisfied:

$$0.3 < f_{123}/|f_4| < 2.0$$

$$0.5 < f/|f_4| < 2.0$$

where f_{123} represents a composite focal length of the first lens and the cemented lens consisting of the second lens and the third lens, f_4 represents a focal length of the fourth lens, and f represents a focal length of whole optical system.

15. (Previously Presented) An imaging optical system comprising, in order from an object side:

a first lens having positive refracting power,

a second lens having negative refracting power, and a concave surface of which is directed toward the object side,

a third lens having positive refracting power, and a convex surface of which is directed toward an image side, and

a fourth lens having negative refracting power,

wherein the second lens and the third lens are cemented together, and

wherein the following condition is satisfied:

$$0.40 (1/\mu\text{m}) < F_{\text{no}}/P(\mu\text{m}) < 2.20 (1/\mu\text{m})$$

where F_{no} represents an F number fully opened and P represents a pitch of an imaging element.

16. (Previously Presented) An imaging optical system comprising, in order from an object side:

a first lens having positive refracting power,

a second lens having negative refracting power, and a concave surface of which is directed toward the object side,

a third lens having positive refracting power, and a convex surface of which is directed toward an image side, and

a fourth lens having negative refracting power,

wherein the first lens is made of glass,

wherein the second lens and the third lens are cemented together, and

wherein the following condition is satisfied:

$$0.40 (1/\mu\text{m}) < F_{\text{no}}/P(\mu\text{m}) < 2.20 (1/\mu\text{m})$$

where F_{no} represents an F number fully opened and P represents a pitch of an imaging element.

17. (New) An imaging optical system comprising, in order from an object side:
a first lens having positive refracting power;
a second lens having negative refracting power, and a concave surface of which is directed toward the object side;
a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,
wherein the first lens is made of glass,
wherein the second lens and the third lens are cemented together,
wherein at least one of surfaces of the fourth lens is an aspherical surface, and
wherein the following condition is satisfied:

$$0.40 (1/\mu\text{m}) < Fno/P(\mu\text{m}) < 2.20(1/\mu\text{m})$$

where Fno represents an F number fully opened and P represents a pitch of an imaging element.

18. (New) An imaging optical system comprising, in order from an object side:
a first lens having positive refracting power;
a second lens having negative refracting power, and a concave surface of which is directed toward the object side;
a third lens having positive refracting power, and a convex surface of which is directed toward an image side; and

a fourth lens having negative refracting power,
wherein the first lens is made of glass,
wherein the second lens and the third lens are cemented together,
wherein at least one of surfaces of the fourth lens is an aspherical surface, and
wherein a cemented lens satisfies the following condition:

$$-0.30 < R_{ave}/R_c < 0.15$$

where R_c represents a radius of curvature of a cemented surface and R_{ave} represents an average value of a radius of curvature of an entrance surface and a radius of curvature of an exit surface.